diagram of an dual input AC/DC power converter 10 having an AC input circuit 21, an up-converter circuit 22 and a down-converter circuit 24 in accordance with an exemplary embodiment of the present invention. The AC input circuit is shown at 21 and is configured in as a fly-back converter. The AC voltage input is fused by F1 and has EMI suppression with C1, L1, C2, C8. The AC voltage is then full wave rectified through D1 and C3-C5. This higher DC voltage (367v max) is fed to the main controller chip U1. This chip is designed for wide mains applications and can be tied directly to the DC rail. The frequency of operation is preset by the manufacturer depending on which version is called out; for example the frequency is typically set at 1OOkhz. The clock on the chip together with the error amplifier, then modifies the output drive duty cycle to power field-effect transistors (FETs) Q2 and Q5. These FETs then switch the main power transformer T1 to deliver pulse width energy through output rectifier D5 and also to the output filter capacitors C6, C7 and C10. I2 and C9 provide additional filtering to reduce ripple and noise at the output.

Please replace the paragraph beginning at page 10, line 5 with the following rewritten paragraph:

Still referring to ~~figure 3~~ Figure 3A, 3B-1, 3B-2, 3B-3 and 3B-4, there is shown a down-converter circuit 24 configured in a standard "buck" topology. Here, the down-converter circuit 24 receives a DC input voltage at node 2, which is the same node at which the AC input circuit 21 and the up-converter circuit 22 provide their DC voltage outputs. U2 is the same part as the controller on the up side. The operating frequency is determined by and is slaved to U3 of the up side. This supply does not require input EMI filtering for this is taken care of by up stream filtering done on both sides of the dual input regulators as discussed earlier. Output drive signals from U2 develops through pre-drivers Q4-5 and Q2 to the P-channel power FETs Q1,3. The FETs on time and duty cycle charge power inductor I1 and then the catch diode D2 supplies the rest of the cycle during Q1,3 off time for normal "buck" operation. The 28V input was chosen to be slightly above the highest output required by the load application of 24V to keep the down-converter circuit 24 in operation $V_{IN} > V_{OUT}$.

Please replace the paragraph beginning at page 11, line 1 with the following rewritten paragraph:

Still referring to Figure 3A, 3B-1, 3B-2, 3B-3 and 3B-4, there is shown at 26 an output voltage programming circuit. Voltage programming is established by R34 which comprises a resistor module. This resistor sets a voltage divider into the non-inverting input pin 2 of U2 which is referenced to the output voltage being fed back through r1 into the inverting input of U2 at pin 1, so as to achieve the desired duty cycle. Components C13, C16 and R17 are included to provide compensation for the error amplifier within U2 to keep the control loop stable over all conditions of line and load values.

Please replace the paragraph beginning at page 11, line 11 with the following rewritten paragraph:

Still referring to Figure 3A, 3B-1, 3B-2, 3B-3 and 3B-4, there is shown at 28 a current limiting circuit. A current limiting function may be programmed by setting removable module R37 to ground. Further, U1b is seen to have its input referenced around a divider coming from the onboard reference of U2 and divided down through R29 and R32. Q9 and D7 allows for a constant current setup to operate regardless of output voltage level. R3 and R5 are the current sense resistors to provide the differential voltage required across the inputs of U1a pins 2 and 3 required to begin the forward bias of D6 which will begin to limit the power to the output via the inverting input of U2. U1 has its VCC tied to the input side of the power converter circuit 20 such that any sensing can be done close to the output voltage and will not require a rail-to-rail costly op-amp.

Please replace the paragraph beginning at page 11, line 23 with the following rewritten paragraph:

Still referring to Figure 3A, 3B-1, 3B-2, 3B-3 and 3B-4, an overprotection circuit is seen at 32. Over-voltage programming is set by R55 to ground and is a module resistor. U5b has a reference set up from the onboard reference of U3 to pin 6 via R58 and R57 divider. Output voltage is sensed and divided down through R59 and R55 provides the other half. In the event of the output attempting to go beyond a prescribed point due to some internal component failure,

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pin 7 of U5b will switch high and shutdown both U3 and U2 via shutdown pin 10 from D14. Q13 will then trigger holding U5b in a constant high state until input power is cycled.

Please replace the paragraph beginning at page 12, line 4 with the following rewritten paragraph:

Still referring to Figure 3A, 3B-1, 3B-2, 3B-3 and 3B-4, a voltage-correction circuit is seen at 34. Module resistor R42, the fourth resistor, is valued at the same value and tolerance as the tip module resistor R46. These resistors are compared through U4a and b. If these values match, then we allow the green led D15 to enable and the user is fairly confident he has the correct voltage programmed for the particular device he is powering with the correct tip. In the event that the tip resistor R46 does not match the module resistor R42, we will enable the red led D10 and also produce an low level audible ping from a piezo telling the user he has incorrectly installed the wrong tip or incorrectly programmed the output in which case another attempt should be made.

Please replace the paragraph beginning at page 12, line 15 with the following rewritten paragraph:

As further shown in Figure 3A, 3B-1, 3B-2, 3B-3 and 3B-4, a thermal shutdown circuit, depicted at 30, will prevent the supply from overheating based on a preset temperature value measured on the case of the supply. U5a has a fixed 2.5v reference set on pin 2 of the comparator via R51 and R54 off of the reference voltage of U3 controller. R53 is a positive temperature coefficient thermistor that will be placed at a key location on the supply to prevent the supply from over heating (ie. Covered up in a blanket). As temperature increases, the resistance value of R53 also increases raising pin 3 to a point above pin 2 where the comparator switches to a high state and through diode D13 switches off U3 and U2 via their shutdown pin 10 which is active high. As the supply cools and U5a switches low, the supply will turn on and operate until another over temperature condition occurs.

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